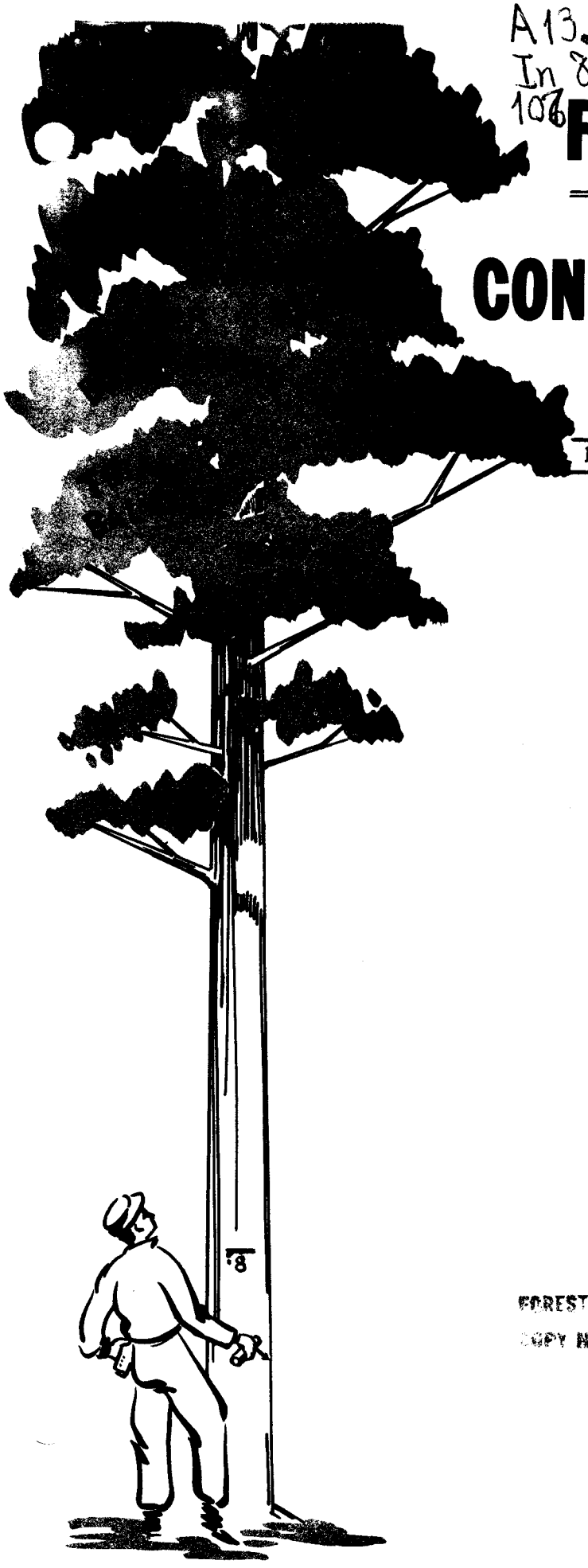

FOREST CONTROL *by* CONTINUOUS INVENTORY

"Today I have grown taller from walking with the trees."

...Karle Wilson

Milwaukee, Wis. January, 1963 No. 106

NEW YEAR 1963

So may the New Year be a happy one to you, happy to many more whose happiness depends on you. So may each be happier than the last, and not the meanest of our brethren or sisterhood debarred from their rightful share in what our Great Creator formed them to enjoy.

Charles John Huffham Dickens

The Chimes, Second Quarter

The Forester

Jan. 1963

IMPORTANCE OF CLASSIFYING THE HEALTH POTENTIAL OF FOREST TREES

Sound, vigorous trees of the forest grow well. They produce good wood in great quantity each year. Almost any commercial forest is the habitat of trees representative of the complete range of vigor classes. In an old woods the proportion of low vigor trees is excessive. Good, young forests harbor more high vigor trees. In forests young or old, good or poor, it is well to know the proportionate share of trees in good and poor health potential classes.

Vigor Grading Commonplace in Region 9

CFI cruisers, in the North Central Region, vigor grade every tree measured. Fast and slow growing trees are segregated, and at each remeasurement the growth is computed for each class. Tree grading rules vary but the grading policy has remained constant.

Half a million tree vigor grade records are available in Region 9. Each record is a diagnosis of the health and form of individual trees measured during the past 10 years. Almost a quarter million of these trees have been graded over again at subsequent measurements of the inventory plots. There are many broad purposes and special uses for these segregations of trees on the basis of health and vigor.

Tree Vigor Values

The condition of timber stands is well defined by the number of high and low vigor trees recorded in forest inventories. The direction and speed of cutting operations necessary for the salvage of trees and stands of declining vigor are indicated. Length of cutting cycle and timber marking rules are guided by the condition of the forest as pictured, often quite dramatically, by information on tree vigor. Tree vigor grading is a great tool for learning and training. Many hundreds of young foresters in several forest regions have received this training in the course of establishing 40,000 to 50,000 CFI plots.

Wood Growth and Tree Vigor

The growth of wood on trees varies directly with their vigor qualifications over short or prolonged periods of time. Even annual records of tree growth, where diameters are precisely measured, show excellent correlation of growth and vigor. An interesting comparison of DBH growth for the dryest and wettest years between 1945 and 1955, is given in tabular form. A total of 1,205 to 1,339 trees is involved in this extraordinary record for the Kettle Moraine, oak-mixed hardwoods sawlog stands growing in Stone's Woods near Hartford, Wisconsin.

ONE YEAR OF DBH GROWTH IN INCHES

TREE CLASS	DRY YEAR	WET YEAR	9-YEAR AVERAGE
High vigor	0.100	0.153	0.134
Medium vigor	0.083	0.121	0.104
Low vigor	0.058	0.095	0.081
Average	0.079	0.121	0.106

Growth is slow in the Kettle Moraine forests of the North Central Region. The tabulated figures are impressive not because of the growth but because of the correlation between growth, tree vigor and precipitation. Efficacy of the tree grading job at the time of the first measurement is also indicated. Precisely made diameter measurements contribute too, to the reliability of the answers.

CORRELATIONS - ANNUAL MEASUREMENTS AND PRECIPITATION

DBH growth during the dry year is 25.5% below the 9-year average
DBH growth during the wet year is 14.2% above the 9-year average
DBH growth during the dry year is 34.7% below the wet year growth

CORRELATIONS - ANNUAL MEASUREMENTS AND TREE VIGOR

DBH growth of low vigor trees is 42.0% below high vigor trees in the dry year.

DBH growth of low vigor trees is 37.9% below high vigor trees in the wet year.

CONCLUSIONS

Glacial till soils and moderate rainfall in the vicinity of Milwaukee, Wisconsin, seldom produce high growth in the unmanaged forest. It is therefore especially important that every intermediate cut remove trees of low vigor, assuring that the maximum growth be placed on the boles of the finest trees.

Tree growth, tree vigor and precipitation relationships developed from permanent CFI plots will always be important in industrial research and development.

Forests will be the beneficiaries, and increased returns from their management the rule, when cruisers learn to take time for tree vigor grading. Some day the mad rush to cut and sell timber must give way a little to new emphasis on silviculture. It is shown in the tabulation that the nine-year average DBH growth of low vigor trees is almost 40% below the growth of good vigor trees. The health potential of each tree is important and basic to the management of forests and to the making of timber sales.

CAL STOTT
Forester

THE TIME IT TOOK TO TALLY

Seven hundred and Fifty-three Permanent Fixed Radius Plots			Four Hundred and Sixty-two Permanent Point Sample Plots		
Trees	recorded	13,855	Trees	recorded	4,068
Total	minutes	42,840	Total	minutes	11,470
Minutes	per plot	56.86	Minutes	per plot	24.84
Trees	per plot	18.40	Trees	per plot	8.81
Minutes	per tree	3.09	Minutes	per tree	2.82
Cull trees included in tally			Cull trees excluded from tally		
Complete tree descriptions and dimensions taken for all trees in all plots.			DBH was checked with an angle gauge, later with a diameter tape and plot radius tape. No other tree details taken.		

Additional time needed to have taken identical tree descriptions and dimensions on all point samples. 17 eight-hour crew days.

These are seventh acre, fixed radius plots. A center stake was set. Each tree was paint numbered.

These are five-factor point sample plots. A center stake was set. Each tree was paint numbered.

All 1215 sample plots were randomly intermingled. Travel time to and from plots was not taken. Time per tree within each plot included the time required to set and witness the center stake. These records were taken directly from CFI plot master cards which were tallied in the woods.

and

Although theoretic considerations indicated an economy of about one-quarter of a cent per tree in permanent point sampling, practical considerations more than wiped out this saving.

CAL STOTT, Forester

1-8-63

MEMORANDUM ON CFI ACCOMPLISHMENTS

Marathon's CFI remeasurement (345 plots) and establishment project (60 plots) got underway the third week of August after a week's training course. They used five crews, all company personnel, and were able to complete the job in seven weeks. Weather in the Amasa area was very poor as they eventually lost two weeks to rain, sleet and even snow. During the course of the project diameter growth was found to be just about what had been expected when compared to the 1957 remeasurement. In the case of tamarack, where repeated defoliation by the larch sawfly had occurred, the crews often noted a loss in diameter over the previous measurement.

Three machine sort checks as well as numerous field checks were made during the duration of the field work to hold cruising and tallying errors to an absolute minimum. The next time a CFI project is carried out the IBM 1401 will do all the machine sort checking. This is a task for which it is seemingly ideally suited.

Daily progress records were kept on all the crews during the project.

A 2" and 4" reproduction mortality study by the species, site, type, etc. was also established on all 405 plots at the time the field work was carried on. It is hoped this study will yield answers which can be successfully tied in with Marathon's cruising projects.

This is one of the oldest, if not the oldest, industrial CFI cases in the Lake States. This time, for the first time, the IBM 1401 computer will be utilized to obtain the results of the inventory.

GENE MEYER
Research & Extension Forester

AN UPPER PENINSULA PROGRAM

FOR RELATING SOILS AND FORESTRY

TOPIC: Future Peninsula-wide work on soils-forest relationships

DATE: January 25, 1963 at 10:00 A.M.

PLACE: U. S. Forest Service Headquarters, Post Office Bldg., Escanaba

For the past 4 years, the U. S. Soil Conservation Service's Marquette (Michigan) office has been cooperating with the Ford Forestry Center in a study of forest growth and other factors in relation to soil type. All of the work to date has been concentrated on the Center's 4,000 acre research forest and on timberland owned by the Ford Motor Company Fund in northern Baraga and northwestern Marquette counties.

This work is tied to permanent Continuous Forest Inventory (C.F.I) plots, of which the Center maintains over 600 and of which public agencies and private companies have established well over 10,000 in Michigan alone. Combining soils information with C.F.I. information has many important advantages, among which are:

1. Possible bias is eliminated in locating both plot and soil sampling locality.

2. A soil scientist determines the soil characteristics without the necessity of making measurements or judgments concerning the forest.

3. A forester measures the plots without having to judge the soil or its characteristics.

4. Detailed information on trees and soil is obtained with maximum economy of time, effort, and money.

5. Detailed periodic remeasurement of the plots is made for other purposes; and successive remeasurement data are equally usable. Thus, data are additive and deductions concerning soils-forest relations become strengthened with each plot remeasurement.

6. Better information concerning the effect of soil type and of selected soil characteristics on tree growth, tree quality, mortality, species preference, etc., should develop which might even result in simpler soil classification for forestry purposes.

7. Information related to soils should be applicable even to areas of the same soil which are not sampled; thus, existing soil maps become more meaningful for forestry purposes and field men can better interpret soils in relation to forestry.

Results of the S.C.S. - Ford Forestry Center study have been promising enough that plans are underway to expand the work on a Peninsula-wide basis. This can most effectively be done if everyone interested in soils-forest relations participates.

Therefore, I hope you or your representative can attend a meeting at the Headquarters of the Upper Peninsula National Forest in Escanaba on January 25, 1963. The meeting will begin at 10:00 A.M.

The purpose of the meeting is two-fold:

1. To review results of past work and discuss the proposed Peninsula-wide program for better quantifying soils-forest relationships.

2. To integrate present and future activity of all public agencies and private organizations interested in soils-forest relationships.

Yours sincerely,

Eric A. Bourdo, Jr.
Director, Ford Forestry Center

CONTINUOUS FOREST INVENTORY WORK SCHEDULE
JANUARY, FEBRUARY, MARCH
1963

JANUARY

2 - 11 The Purdue Project. Preparation of check listings and final tabulations of repetitive annual records for student study and Newsletter use.

Copper Range CFI. Preliminary check of plot total listings with Del Harma in Milwaukee, Wisconsin.

14 - 18 Held open for possible CFI planning with Menominee Enterprises and Wisconsin Conservation Department. The establishment of standards essential to successful inventory controls preliminary to the development of flow charts and plans, and machine specifications.

Preparation of CFI Newsletter material on Growth Components with examples.

21 - 31 IBM Basic Computer Systems. This is the third data processing school course for Dick Smith. Conference on CFI for Missouri.

Correspondence, CFI Newsletter and meetings.

FEBRUARY

4 - 8 CFI remeasurement planning with Escanaba Paper Company in Milwaukee. Data processing plans.

11 - 22 CFI data processing, and machine training. The Copper Range Company, in Milwaukee, Wisconsin. Report and management plan outlines.

25 - 28 Purdue University inventory control and data processing course at Lafayette, Indiana. Programs and diagrams for the IBM 1620. Student contacts.

MARCH

1 - 8 Held open for final data processing plans for Menominee Enterprises and Wisconsin State Conservation Department. In Milwaukee, Wisconsin.

Card layouts and orders must be completed in March to secure the cards for use in late July, 1963.

11 - 20 CFI final flow charts and plans with Mosinee Paper Mills Co. In Milwaukee, Wisconsin.

21 - 29 Correspondence, CFI Newsletter material, Purdue Project. Finishing touches on Menominee Enterprises CFI plans.

CAL STOTT
DICK SMITH

Foresters